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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/615,675	07/08/2003	Trond A. Jorgensen	7885.91US01	9822
23552	7590	09/15/2004	EXAMINER	
MERCHANT & GOULD PC P.O. BOX 2903 MINNEAPOLIS, MN 55402-0903			HAN, JASON	
			ART UNIT	PAPER NUMBER
			2875	

DATE MAILED: 09/15/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/615,675

Applicant(s)

JORGENSEN, TROND A.

Examiner

Jason M Han

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 08 July 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-18 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-18 is/are rejected.
- 7) ☒ Claim(s) 1,2,9,11,12 and 17 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 08 July 2003 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.
- ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- ☐ Notice of Informal Patent Application (PTO-152)
- ☐ Other: _____.

DETAILED ACTION

Priority

1. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file. Please note that the foreign priority date of July 8, 2003 is the same as the U.S. filing date.

Drawings

2. The drawings are objected to because in Figure 4: (47) should be labeled as (57), or vice versa, as described in the Specification [Page 7, Line 36]. Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Specification

3. The disclosure is objected to because of the following informalities:
 - a. Section (e.g. Background, Brief Description of Drawings, etc.) headings are missing;
 - b. Page 2, Line 4: Grammatical error “ha”;
 - c. Page 4, Line 28: Grammatical error “may LumiLEDs”;
 - d. Page 6, Line 4: Please elaborate what F# is;
 - e. Page 6, Line 26-27: incorrect syntax – please reword the sentence to read: “The regulating unit then receives the detected values from the light sensor, such as photo sensitive material / film, compares them to reference values, and communicates with the control units for adjusting the spectral characteristics of the light emitting devices to obtain the desired output.”
 - f. Page 7, Line 31: Please elaborate what F# is.

Appropriate correction is required.

Claim Objections

4. Claim 1 is objected to because of the following informalities: The term “etc.” renders the claim indefinite. Please use positive, clear, and definite language, rather than broad and open-ended statements. Appropriate correction is required.
5. Claim 2 is objected to because of the following informalities: To quote the inventor on Page 5, Lines 24-32: “One possible configuration is to couple groups of light emitting devices in series, where each group is connected to a control unit and/or a power supply unit. In this way, the groups may be connected individually, providing

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good control of the emitted light while enabling more light to be emitted with a small amount of electronics (underline added by examiner).” It seems unreasonable to add multiple power supply units when the same function could be met by a single source with multiple switches for current flow to said groups of light emitting devices [Please note International Publication Number WO 02/08010136 – Figure 5 and Summary], especially when the applicant is taking into consideration a smaller package for the electronics.

6. Claim 9 is objected to because of the following informalities: The term “preferably” is indefinite. Please use positive, clear, and definite language in the limitation. Appropriate correction is required.

7. Claims 11-12 are objected to because of the following informalities: To quote the inventor on Page 6, Lines 23-29: “The light sensor may be connected to a regulating unit. The regulating unit then receives the detected values from the light sensor, compares them to reference values, and communicates with the control units for adjusting the spectral characteristics of the light emitting devices to obtain the desired output, such as photo sensitive material / film. The reference values may be pre-set in the calibrating unit, or may be dynamic variables received from an external system, e.g. from a system controlling the resulting image of a projection system etc.” It is unnecessary, bar malfunction, that a controller would need a light sensor for the defined function above. It is already assumed and inherent that the controller would provide the light characteristics or desired optical output required to efficiently display an image.

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The examiner requires further elucidation with respect to the need and use of said light sensors.

8. Claim 12 is further objected to because of the following informalities: It is under the assumption that the claim dependency is on Claim 11 rather than Claim 10.

Otherwise, the light sensor lacks antecedent basis. Appropriate correction is required.

9. Claim 17 is objected to because of the following informalities: It is under the assumption that the claim dependency is on Claim 16 rather than Claim 15. Otherwise, the temperature sensor lacks antecedent basis. Appropriate correction is required.

10. Claim 17 is further objected to because of the following informalities: "Cooling system" lacks antecedent basis. It is under the suggestion of the examiner that the applicant make Claim 17 dependent on Claim 16, which is further dependent on Claim 15. Appropriate correction is required.

Claim Rejections - 35 USC § 103

11. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

12. Claims 1-10, 13-15, and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Arnold (U.S. Patent Number 6220725) in view of Parker et al. (U.S. Patent Number 6224216).

With regards to Claim 1, Arnold discloses an integrating cavity light source comprising of a housing [Figure 1A: (2)] having a diffusely light reflective interior surface

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[Figures 8-11: (12); Column 3, Lines 27-28], an exit aperture [Figures 8-11: (118)], and a cavity defined within said housing [Abstract]; at least one light emitting device mounted on a wall of said housing [Figures 8-11: (10)]; and an electrical power supply unit [Abstract; Column 2, Lines 9-10].

Arnold does not disclose said integrating cavity light source as a means for illuminating a microdisplay device wherein the exit aperture of said cavity is adapted to the shape and size of said microdisplay device. Arnold also does not specifically disclose an electronic control unit for said light emitting device.

Parker discloses a system and method employing LED light sources [Figure 2: (32); Column 2, Lines 35-40] for a projection display, wherein said LEDs are controlled by a display controller [Figure 2: (56)] and whereby said light from the LEDs propagates to a display device [Figure 2: (44); e.g. DMD, Column 1, Lines 25-26].

It would have been obvious to integrate the cavity light source of Arnold as a means for illuminating a microdisplay device as taught by Parker in order to provide a bright and efficient optical performance for a conventional projector. It is also obvious that said cavity light source could replace the optical integrator of Parker [Figures 2 and 6: (40); Column 6, Line 46-Column 7, Line 29], whereby both are functionally equivalent. In addition, it would have been obvious to modify the cavity light source of Arnold to incorporate the electronic controller of Parker in providing synchronization of the outputs for said LEDs [Column 7, Line 66-Column 8, Line 4].

13. With regards to Claim 2, Parker teaches a triple-path projector employing three different single color LED arrays that emit light that propagates along separated optical

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paths, in order to provide greater illumination or brightness. It is advantageous that said LED arrays may be left on continuously and do not require color frame synchronization as found in a single-path embodiment [Column 8, Lines 5-44]. It is noted by the examiner that said triple-path embodiment [Figure 9] comprises of a single power supply whereby each path is connected to a combiner [Figure 9: (122)], and therefore is considered functionally equivalent to applicant's disclosure of individual driving of several light emitting devices or groups of light emitting devices whereby it enables simultaneous driving of different wavelengths for boosting white or secondary colors. Therefore, multiple power supplies is considered a matter of design choice by the examiner, and said triple-path embodiment could easily be adapted to incorporate three different power supplies for each LED array.

14. With regards to Claim 3, both Arnold [Figures 8-11: (10); see also Abstract] and Parker [Figure 9: (34, 70r, 70g, 70b)] disclose at least two light emitting devices supplied with electricity from a single power supply unit.

15. With regards to Claim 4, both Arnold [Column 3, Lines 52-54] and Parker [Column 2, Lines 35-40] teach at least two light emitting devices are adapted for emitting light with different wavelengths.

16. With regards to Claim 5, Parker discloses the control unit being adapted to control on and off switching of the light emitting in sequences [Column 3, Lines 1-12; see also Summary].

17. With regards to Claim 6, Parker discloses a control unit adapted to adjust the wavelength and brightness/intensity of the light emitted by individual control of the light

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emitting devices or groups of light emitting devices [Column 3, Lines 1-12; see also Summary].

18. With regards to Claim 7, Parker discloses said light emitting devices adapted to emit red (R), green (G), and blue (B) light; and whereby said control unit is adapted to switch said devices on and off to provide cycles of said colors to a microdisplay device [Column 3, Lines 1-12; see also Summary].

19. With regards to Claim 8, both Arnold [Figure 8: (120, 126)] and Parker [Figure 1: (38, 40, 42)] disclose optical components inside a cavity of a housing.

20. With regards to Claim 9, Parker discloses a lens [Figure 2: (42)] within a cavity [Figure 2: (48)] and obstructing the light path of said light source.

21. With regards to Claim 10, both Arnold [Figure 9: (126)] and Parker [Figure 2: (46)] disclose a transparent window/lens for closing an aperture to a housing.

22. With regards to Claim 13, Parker [Column 4, Lines 15-24] teaches a housing made of a material with good thermal conductivity properties.

23. With regards to Claim 14, Parker teaches a cooling system [Figure 2, (50); Column 4, Lines 15-24].

24. With regards to Claim 15, Parker discloses a cooling system [Figure 2, (50)] completely embedded in a housing [Figure 2, (30)].

25. With regards to Claim 18, both Arnold [Figure 9: (126)] and Parker [Figure 2: (42), where optical components (38, 40) are functionally equivalent to Arnold's cavity] disclose an imaging and/or integrating optics obstructing a light path outside of an exit aperture and a housing.

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26. Claims 11-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Arnold (U.S. Patent Number 6220725) in view of Parker et al. (U.S. Patent Number 6224216) as applied to Claim 1 above, and further in view of Kanayama (U.S. Patent Number 4897639).

Arnold in view of Parker disclose a illuminating cavity for a microdisplay device as described above in Paragraph 12.

Arnold in view of Parker does not disclose an illuminating cavity comprising a light sensor, which is further connected to a control unit to adjust optical characteristics of light sources within said cavity.

Kanayama discloses an image forming method whereby multiple light-emitting diodes in an array are supplied with a constant amount of electric current and the duration of time for which that current is supplied to the individual light-emitting diodes is changed according to the specific level of contrast to be produced. The amount of light received by a light-sensitive material can thus be controlled so that a halftone image is formed. The duration of time for which the electric current is applied to the individual light-emitting diodes consists of a predetermined constant portion and a variable portion to be added thereto. The variable portion is compensated for in accordance with the difference between the relative intensities of light emission from the individual light-emitting diodes when they are supplied with the constant electric current [Figure 2; see also Abstract].

It would have been obvious to modify the illuminating cavity of Arnold in view of Parker to incorporate the illumination control of Kanayama in order that the amounts of

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light emission from individual light-emitting diodes are rendered sufficiently uniform to effectively compensate for variation in the intensity of light emission from said light-emitting diodes [see Abstract of Kanayama].

27. Claims 16-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Arnold (U.S. Patent Number 6220725) in view of Parker et al. (U.S. Patent Number 6224216) as applied to Claim 1 above, and further in view of Skinner et al. (U.S. Patent Number 6447146).

Arnold in view of Parker disclose a illuminating cavity for a microdisplay device as described above in Paragraph 12.

Arnold in view of Parker does not disclose an illuminating cavity comprising a temperature sensor, which is further connected to an electronic control unit.

Skinner discloses a means for controlling temperatures in a back light of a flat-panel display (e.g. LCD), whereby temperature sensors [Figure 7: (71, 63, 64)] are in electrical communication with a microprocessor [Figure 7: (70)] that controls cooling fans [Figure 7: (29)].

It would have been obvious to modify the illuminating cavity of Arnold in view of Parker to incorporate the cooling control system of Skinner, whereby a mechanism is provided for achieving luminance stability of the light sources, high efficiency and long life through controlling and maintaining said light sources' temperatures [see Abstract of Skinner]. In other words, it provides a means for safely preventing overheating due to high ambient temperatures within a housing and component failures.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

The following patents have been cited to further show the state of the art with respect to the current application:

International Publication Number WO 02/080136 to Parker;

U.S. Patent 5548120 to Parker et al.;

U.S. Patent 5724062 to Hunter;

U.S. Patent 4954914 to Karita et al.;

U.S. Patent 5808800 to Handschy et al.;

U.S. Patent 6547423 to Marshall et al.;

U.S. Patent 5467146 to Huang et al.;

U.S. Patent 6402347 to Maas et al.;

U.S. Publication Number 2002/0163791 to Parker.


Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jason M Han whose telephone number is (571) 272-2207. The examiner can normally be reached on 8:00am-5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Sandra O'Shea can be reached on (571) 272-2378. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

JMH



JOHN ANTHONY WARD
PRIMARY EXAMINER